



## CITY OF LODI

## COUNCIL COMMUNICATION

AGENDA TITLE: Specifications and Advertisement for Bids for Electrical Cable for the Electric Utility Department

MEETING DATE: November 18, 1992

PREPARED BY: Electric Utility Director

RECOMMENDED ACTION: That the City Council approve the specifications and authorize advertisement for bids for the purchase of 30,000 feet of #2/0 15kV underground primary conductor, and 10,000 feet of 600-volt secondary triplex for the Electric Utility Department.

BACKGROUND INFORMATION: This cable will be needed for installation in eleven new residential and commercial subdivisions scheduled to begin during the next six to twelve months, and to provide an inventory for routine or emergency maintenance of the existing electrical system.

Some of the developments where this cable will be used are Sunwest Plaza 2, Johnson Ranch 2, Century Meadows 1, 2, and 3, Towne Ranch 1, and the new Target store. As home construction continues beyond the 12-month horizon, additional 600-volt triplex will be needed, and bids will be solicited at that time.

FUNDING: Included in the Electric Utility Department's 1992/93 fiscal year budget.  
Estimated cost: \$40,000

BID OPENING DATE: December 22, 1992

*Henry J. Rice*  
Henry J. Rice, Electric Utility Director

Prepared by Joel Harris, Purchasing Officer

APPROVED

*Thomas A. Peterson*  
THOMAS A. PETERSON  
City Manager



recycled paper

EQUIPMENT SPECIFICATIONS

REV. 4/10/90

600-VOLT XLPE TRIPLEX CABLE

GENERAL:

CABLE FURNISHED UNDER THESE SPECIFICATIONS SHALL BE LIMITED TO CROSS-LINKED POLYETHYLENE INSULATED CABLE RATED 600 VOLTS AND SUITABLE FOR INSTALLATION IN DUCTS OR FOR DIRECT BURIAL IN EARTH, IN WET OR DRY LOCATIONS, WITH NORMAL CONDUCTOR TEMPERATURES UP TO 90 DEGREES C. CABLES FURNISHED SHALL MEET THE REQUIREMENTS OF THE APPLICABLE NEMA, ICEA, AEIC AND ASTM STANDARDS, LATEST EDITION THEREOF, UNLESS OTHERWISE NOTED IN THIS SPECIFICATION.

CABLE:

A. CONDUCTOR:

THE CONDUCTOR SHALL BE ALUMINUM ALLOY, EC GRADE, 1/2 TO 3/4 HARD, CLASS B STRANDING.

B. INSULATION:

PHASE CONDUCTOR INSULATION SHALL BE SINGLE-PASS, BLACK, CROSS-LINKED POLYETHYLENE. THE NEUTRAL CONDUCTOR SHALL HAVE YELLOW XLPE INSULATION OR BLACK XLPE INSULATION WITH YELLOW EXTRUDED STRIPES.

C. ASSEMBLY:

THE ASSEMBLED CABLE SHALL CONSIST OF PHASE AND NEUTRAL CONDUCTORS TWISTED TOGETHER WITH A LAY NOT LESS THAN 50 NOR MORE THAN 60 TIMES THE OUTSIDE DIAMETER OF ONE OF THE PHASE CONDUCTORS. ALL CABLE ENDS SHALL BE SEALED TO PREVENT THE ENTRANCE OF MOISTURE.

D. IDENTIFICATION:

EACH CONDUCTOR SHALL HAVE A PERMANENT MARKING SHOWING THE MANUFACTURER'S NAME, VOLTAGE RATING, CONDUCTOR SIZE AND TYPE OF INSULATION.

E. TESTING AND GUARANTEE:

TESTING OF CABLE SHALL BE PERFORMED ACCORDING TO PROCEDURES SET FORTH BY THE ICEA, AEIC AND ASTM. CERTIFIED COPIES OF PASS/FAIL TEST RESULTS SHALL BE SUPPLIED. ANY CABLE FOUND DEFECTIVE EITHER UPON INSPECTION, TESTING OR INSTALLATION WILL BE RETURNED AT THE MANUFACTURER'S EXPENSE.

F. SPECIFIC REQUIREMENTS:

ANY CONDITIONAL BIDS SUCH AS "SUBJECT TO AVAILABILITY IN STOCK" WILL BE REJECTED.

G. SHIPPING:

CABLE ENDS SHALL BE ADEQUATELY SEALED WITH A WATER SEAL-TYPE MATERIAL AND PLASTIC END CAPS SECURED BY TAPE TO PREVENT THE PENETRATION OF **MOISTURE**. THERE SHALL BE NO WATER IN THE STRANDED CONDUCTOR OF THE CABLE WHEN THE REEL IS SHIPPED. ALL SHIPMENTS SHALL **BE** PREPAID, F.O.P. LODI, CALIFORNIA. REELS SHALL **BE** SHIPPED UPRIGHT:

REELS:

A. MAKEUP:

THE SPECIFIED CONDUCTOR SHALL BE SUPPLIED ON NEMA STANDARD REELS AND IN ACCORDANCE WITH TABLE I AS SHOWN **BELOW**.

TABLE I

CONDUCTOR SIZE PHASE (NEUTRAL)	CODE WORD	MATERIAL	NEMA STANDARD REEL CODE NO.
#2 ( <b>#2</b> ) AWG	RAMAPO/YES	ALUM.	<b>3624</b>
#1/0 ( <b>#1/0</b> ) AWG	BERGEN/YES	ALUM.	3624
350 MCM ( <b>#4/0</b> ) AWG	WESLEYAN/YES	ALUM.	<b>5432</b> OR 7236

B. PACKAGING:

EACH CABLE REEL SHALL HAVE ADEQUATE PROTECTIVE COVERING ACROSS THE FLANGES, SUCH COVERING TO CONSIST OF WOOD MEMBERS **FROM** FLANGE TO FLANGE COVERING THE ENTIRE CIRCUMFERENCE OF THE REEL (LAGGING), THE LAGGING SHALL BE NAILED TO THE FLANGE PERIMETERS AND SHALL BE FURTHER SECURED WITH AT LEAST TWO STEEL BONDS AROUND THE REEL. EACH END OF THE CABLE SHALL **BE** FIRMLY SECURED TO THE REEL.

C. MARKING:

EACH REEL SHALL **BE** MARKED WITH A DURABLE LABEL SECURELY ATTACHED TO A FLANGE OF THE REEL AND PLAINLY MARKED STATING **THE** DESTINATION, THE PURCHASER'S ORDER NUMBER, SHIPPING LENGTH **OF** CABLE ON REEL, TYPE AND SIZE **OF** CONDUCTORS, INSULATION TYPE AND THICKNESS, VOLTAGE RATING AND MANUFACTURER'S IDENTIFICATION NUMBER.

CITY OF LODI ELECTRIC UTILITY DEPARTMENT

EQUIPMENT SPECIFICATIONS

15-KV, XLPE INSULATED, JACKETED AND NON-JACKETED,

CONCENTRIC NEUTRAL CABLE

1.0 GENERAL

Cable furnished under these specifications shall be limited to cross-linked thermosetting polyethylene (XLPE) insulated concentric neutral cable rated 15,000 volts and suitable for installation in ducts or for direct burial in earth, in wet or dry locations, with normal conductor temperatures **up** to 90°C. Cables furnished shall meet the requirements of the applicable NEMA, ICEA, AEIC and ASTM Standards, latest edition thereof, unless otherwise noted in this Specification.

2.0 CABLE

A. Conductor

Insulated conductor shall be aluminum alloy, EC Grade, Class 8, stranded or compressed strand, three-quarter or half hard.

B. Conductor Shield

The conductor (strand) shielding shall be extruded and shall consist of virgin black semi-conducting cross-linked, thermosetting polyethylene. The extruded shield shall have an average thickness of not less than 15 mils when measured over the top of the strands and a minimum thickness of not **Jess** than 12 mils. The outer surface of the conductor shield shall be cylindrical and shall be firmly bonded to the overlying insulation.

C. Insulation

Insulation shall be unfilled, semi-transparent, cross-linked thermosetting polyethylene extruded directly over the conductor shield. The average insulation thickness shall not be less than 220 mils and the minimum thickness shall not be less than 90% of this value.

D. Insulation Shield

The insulation shielding shall be extruded and shall consist of one layer of virgin black semi-conducting, cross-linked thermosetting polyethylene, compatible with and extruded over the insulation. It shall maintain its shielding properties after exposure to normal operating temperatures and environs. The insulation shield compound and this pass shall be in accordance with AEIC Standard.

E. Construction Method

Conductor shield, insulation and insulation shield shall be installed on the conductor using the triple extruding, dry cure method.

F. Concentric Neutral

The concentric conductor shall be composed of a number of round annealed bare (uncoated) copper wires helically wrapped around the cable. The number and size of the neutral wires shall be as specified in Table I. The length of lay shall not be less than 6 nor more than 10 times the diameter over the concentric wires.

G. Overall Jacket (if required on Proposal Form)

An extruded, encapsulating and insulating layer of linear, low density black polyethylene, (Union Carbide DFDB 6425, British Petroleum BP D 995, or approved equivalent) shall be applied over the concentric

neutral wires in accordance with ICEA S-66-524, Part 4.3, except where modified by this Specification. The minimum thicknesses of this encapsulating jacket over the concentric wires shall be as follows:

<u>Conductor Size</u> <u>(AWG or KCM)</u>	<u>Minimum Thickness</u> <u>(Mils)</u>
#2	50
#2/0	80
750 & 1,000	110

#### H. Testing and Guarantee

Testing of cable shall be performed according to procedures set forth by the ICEA, AEIC and ASTM Standards. Certified copies of **pass/fail** test results shall be supplied. Any cable found defective either upon inspection, testing or installation will be returned at the manufacturer's expense.

#### I. Specific Requirements

Any conditional bids such as "subject to availability in stock" will be rejected. Cable shall be furnished according to Table I below:

TABLE I

<u>Conductor Size</u> <u>AWG or KCM</u> <u>(No. of Strands)</u>	<u>Conc. Neutral</u> <u>Size - AWG</u> <u>(Min. No. of Wires)</u>	<u>Material</u> <u>Phase (Neut.)</u>	<u>Insulation</u> <u>Thick. (Mils)</u>	<u>NEMA</u> <u>Reel Code</u> <u>Number</u>
#2 (7)	#14 (10)	Alum. (Cu)	220	5832
#2/0 (19)	#14 (9)/#12 (6)	Alum. (Cu)	220	5832
750 (61)	#12 (24)/#10 (15)	Alum. (Cu)	220	7848
1,000 (61)	#10 (20)	Alum. (Cu)	220	7848

**NOTE:** Refer to proposal forms for specific sizes, quantities and jacketing requirements.

## J. Reels

### 1. Makeup and Length:

Reels are to be shipped full to their maximum capacities.

### 2. Packaging:

Each cable reel shall have adequate protective covering across the flanges. Such covering to consist of wood members from flange to flange covering the entire circumference of the reel (lagging). The lagging shall be nailed to the flange perimeters and shall be further secured with at least two steel bands around the reel. Each end of the cable shall be firmly secured to the reel.

### 3. Marking:

Each reel shall be marked with a durable label securely attached to a flange of the reel and plainly marked stating the destination, the purchaser's order number, shipping length of cable on reel, weight of reel (tare weight), total weight of cable on reel, type and size of conductor, insulation type and thickness, voltage rating and manufacturer's identification number.

## K. Shipping

Cable ends shall be adequately sealed with a water seal-type material and plastic end caps secured by tape to prevent penetration of moisture. There shall be no water in the stranded conductor of the cable when the reel is shipped. Reels shall be shipped upright. All shipments shall be prepaid, F.O.B. Lodi, California.

o